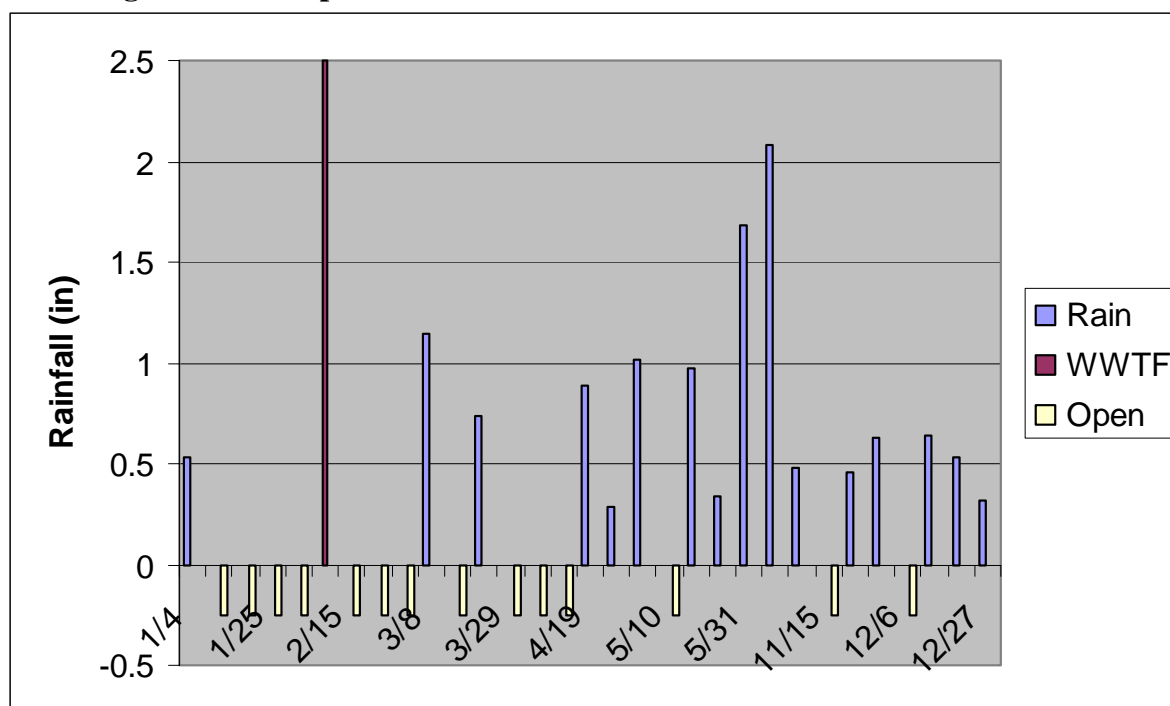


CLOSURES

Rainfall/Conditional Closures

In 2003, the only areas classified as “Conditionally Approved” for rainfall were some sections of Hampton/Seabrook Harbor (rainfall closure threshold of 0.25 inches), as well as portions of Little Harbor (rainfall closure threshold of 0.50 inches). Figure 6a depicts the pattern of open/closed weekends for calendar year 2003 in Hampton/Seabrook, while Figure 6b shows similar information for Little Harbor. Blue bars represent weekends when the harbor was closed to harvesting due to rainfall, with the size of the bar indicating the amount of rain that caused the closure. Red bars represent weekends when the area was closed for a wastewater treatment facility upset. Yellow bars depict weekends that were open for harvesting.

Figure 6a: Hampton/Seabrook Rainfall Closures for 2003 Weekends

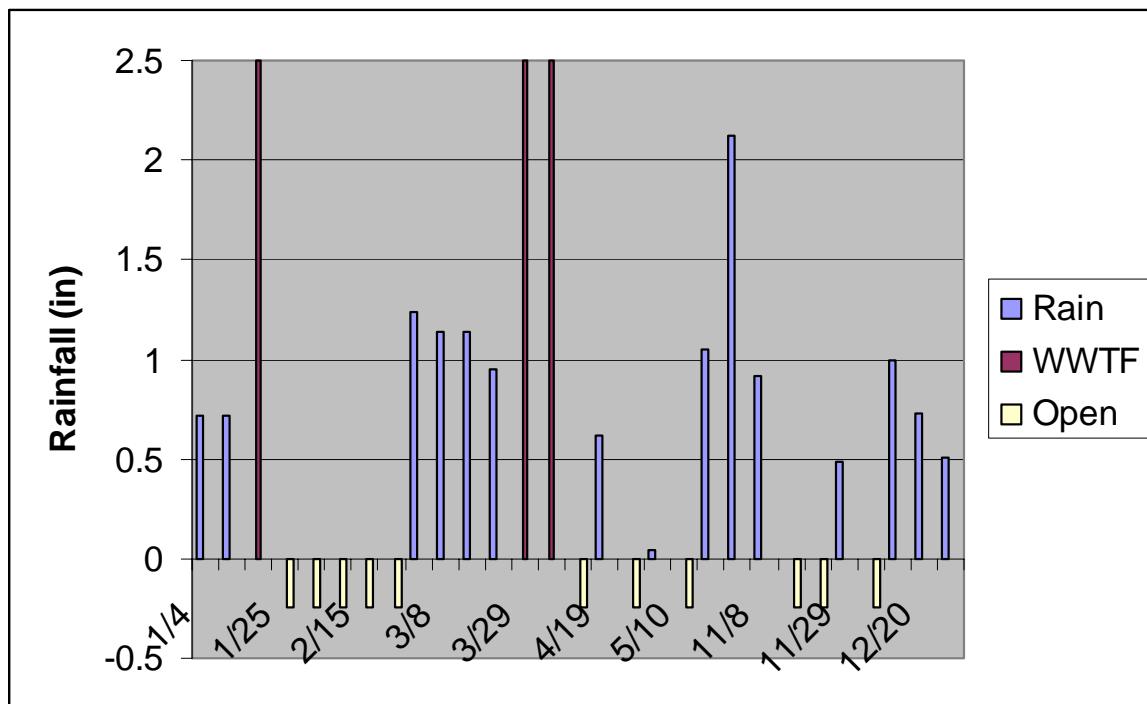


Weather conditions in early 2003 were relatively favorable for harvesting opportunities, but less favorable in the spring and fall. Of the 31 days during the January-May and November-December open season in Hampton/Seabrook, 14 days (45 percent) were open for harvesting (48 percent and 38 percent in 2002 and 2001, respectively). Of the 16 storms that caused a closure, 11 (69 percent) were over 0.50" of rainfall. A total of 23 sampling runs were conducted after the rainfall events that caused a closure. Eleven of these runs produced data that supported opening the flats before the typical 14-day closure period had elapsed.

In Little Harbor, there were 29 weekends during which harvesting could have occurred (January to mid-May, November-December). 11 days (38 percent) were open for harvesting. Three of the closures were a result of operational problems at the Portsmouth wastewater treatment facility,

while the other 15 were caused by rainfall events. Of these 15 rainfall closures, five were for storms of over one inch, while eight were in the 0.50-1.00 inch range. Two of the closures were based on weather forecasts of heavy rain which never materialized (forecast for the evening of May 2, 2003 was for heavy rain, but only 0.04" fell. Forecast for November 28, 2003 called for heavy rain, but only 0.49" fell). A total of 10 sampling runs were conducted after the rainfall events that caused a closure. Four of these runs produced data that supported opening the flats before the typical 14-day closure period had elapsed.

Figure 6b: Little Harbor Rainfall Closures for 2003 Weekends



Emergency Closures

2003 was a busy year for closures caused by sewage overflows from municipal wastewater treatment facilities and/or sewage collection infrastructure. Closed status sampling (water and shellfish tissue) is initiated after such closures to generate data used to drive decisions on when a reopening of the growing area is appropriate. Sewage discharge events that triggered sampling in 2003 included:

- January 13 and January 22 pump station overflows on the Bellamy River, Dover
- February 4 discharge of improperly disinfected sewage, Hampton WWTF
- March 21 and March 26 combined sewer overflow events in Exeter
- March 23, April 1 discharges of improperly treated effluent, Portsmouth WWTF
- April 15 Durham sewer line break near the WWTF on the Oyster River
- June 25 Dover pump station overflow (no closure needed)
- July 15 discharge of unchlorinated effluent from Exeter (no closure needed)

- August 24 pump station overflow in Seabrook (no closure needed)
- September 23 CSO discharge from Exeter (no closure needed)
- October 2 unchlorinated effluent discharge from Hampton (no closure needed)
- October 30 high fecal coliform counts due to moderate/heavy rainfall

Table 1 lists the emergency closures related to sewage overflows from wastewater treatment facilities or sewage collection infrastructure implemented in 2003.

Table 1: WWTF-Related Emergency Closures Implemented in 2003

Area	Sewage Discharge Event	Dates Closed to Harvesting
Great Bay, Little Bay	1/4/03: 66,000 gallon pump station overflow to Bellamy River (from Mill Street station) 1/9/03: 250,000 gallon pump station overflow to Bellamy River (from Charles Street station)	1/10/03-1/24/03 for Great Bay; 1/11/03 and 1/18/03 for Little Bay
Great Bay, Little Bay	3/21/03: 235,000 gallon Exeter CSO discharge 3/31/03: ~302,000 gallon Exeter CSO discharge	3/21/03-4/15/03 for Great Bay; 3/22/03, 3/29/03, 4/5/03, 4/12/03 for Little Bay
Little Bay	4/15/03 6,000 gallon raw sewage discharge from sewer line break in Durham on banks of Oyster River	4/19/03
Little Harbor	12/28/03: 289,000 gallon CSO discharge from South Mill Pond. Reported by City of Portsmouth on 1/13/03. Rainfall contributed to all three weekend closures	1/4/03 1/11/03 1/18/03
Little Harbor	3/23/03: 3.8 million gallons of undisinfected effluent from Portsmouth WWTF. Additional ~15,000 gallon overflow of raw sewage from WWTF on 4/1/03	3/29/03 4/4/03
Hampton Seabrook	2/4/03: 25,000 gallons of undisinfected effluent from Hampton WWTF	2/8/03
Atlantic Coast	None	None

Paralytic Shellfish Poisoning Closures

After a series of low (<44) PSP levels in blue mussels to start the PSP monitoring season, an increase in toxicity was observed in early June. When the June 3, 2003 sample from Star Island exceeded the 80 microgram limit, a closure to the offshore aquaculture site was immediately instituted, and sampling at secondary stations in the nearshore environment (Rye Ledge, Little Harbor) began. Soon after this event, neighboring states began observing increased PSP levels at their sites, and implemented closures as well. Samples from numerous New Hampshire locations the following week showed elevated levels of toxin. Although no inshore sampling stations exceeded the 80 microgram threshold, the elevated toxin levels, coupled with high and rising toxin levels in

southern Maine waters, prompted DES to extend the closure to all Atlantic coast growing waters on June 13, 2003. Continued sampling at primary and secondary sampling stations, including two stations in the Great Bay Estuary (oyster and mussel sampling), continued in June. A continuation of the elevated, and in some cases rising, toxin levels were observed at all sites during the week of June 16, 2003, as well as during the week of June 23, 2003. Subsequent tests showed decreasing toxin levels, allowing the closure to be lifted in July. The closure affecting offshore Atlantic waters was implemented on June 4, 2003, and lifted on July 8, 2003 (35 days). The closure affecting all Atlantic Coastal waters was implemented on June 13, 2003, and lifted on July 2, 2003 (19 days).



Blue mussels collected from Star Island, Isles of Shoals. Mussels from Hampton Harbor are placed in plastic mesh cages, transplanted to Star Island, and collected weekly in the spring, summer, and fall for “red tide” testing. This sampling program is a cooperative effort among DES, the Isles of Shoals Steamship Company, the Star Island Corporation, and the volunteers of the Great Bay Coast Watch (DES Shellfish Program photo)

In response to elevated/high levels at some stations, the State of Maine implemented another closure in the fall of 2003; however, New Hampshire sites did not show any sign of elevated or high toxicity during this period, so no additional closures were implemented.

Seasonal/Marina Closures

Areas with large concentrations of boats (marinas, mooring fields) pose a seasonal risk of sewage contamination. Some of these marinas/mooring fields are adjacent to shellfishing areas that are available for harvest on a conditional basis. Weekly surveys (spring and fall) of the number of boats present (especially those likely to have sanitary waste disposal equipment) determine when these areas are seasonally opened and closed. Table 2 summarizes the dates that conditionally approved areas were closed and reopened as a result of these surveys.

Table 2: Seasonal Closures and Reopenings Adjacent to Marinas and Mooring Fields

Area	Date Closed	Date Reopened	Comments
Hampton/Seabrook	6/1/03	11/1/03	A sufficient number of boats had been hauled out by 10/20/03; seasonal closure kept in place due to ongoing water quality concerns
Little Harbor	5/23/03	10/28/03	A sufficient number of boats had been hauled out by 10/28/03; seasonal closure kept in place until 11/15/03 because of heavy rainfall events
Lower Little Bay	6/1/03	11/2/03	Seasonal closure coincident with F&G seasonal closure
Upper Little Bay	7/28/03	9/24/03	None